



# Level of parents' knowledge and practice in management of their children's febrile illness, in Al Baha City, Saudi Arabia

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## ABSTRACT

Studies found that most of the parents were uncertain about the use of antibiotics for children's fever. This study aimed to evaluate knowledge and practice of parents in child fever management in Al Baha City, Saudi Arabia. A cross-sectional study was done on 431 participants using an electronic questionnaire including items about participants' knowledge of fever and its health effects, practice in fever management, how to measure temperature, fever treatment given without prescription, when to decide to visit the health providers, difficulty faced when giving medication, parents' concerns about fever. 9% of parents had history of child febrile, 92.8% and 93.3% knew normal temperature and truly defined fever respectively, 96% thought fever is harmful, 39.4% thought that they had enough information about fever, and 91.4%, 82.6%, 86.3%, and 87.9%, thought that febrile convulsion, loss of consciousness, dehydration, brain damage were the most common concerns respectively. About 88% of parents use a thermometer for fever, 89.6% apply cold compressions and 93.5% decide to take the child to hospital due to high fever. The most common difficulty faced in giving fever medicine was deciding the amount and frequency of dosing. Mothers and parents with 36-45 years had a significantly



higher percentage of those thought fever may be useful and mothers with a university education were significantly afraid of febrile convulsions and brain damage. There is a need to raise awareness of parents about the right management of children as wrong concerns can make them fail to act properly.

**Keywords:** parents, knowledge, practice, febrile, illness, Al Baha, fever, paediatrics, pyrexia

## 1. INTRODUCTION

Fever has a beneficial physiological impact in the battle against illness and may suggest that severe conditions are present (Enarson et al., 2012). But severe parental concern about the fever of a child is known as 'fever phobia,' which can be found to be associated with the use of inappropriate medicine and over-management at home, a problem that can affect the protection of the child (Chiappini et al., 2012; Chang et al., 2013). Around 10% of the populations in Saudi Arabia are children under 4 years of age, resulting in a high burden of childhood illnesses like fever (Hussain et al., 2020). In 2018, a study was conducted in Riyadh Region, Saudi Arabia to examine the understanding and experience of parents in home fever management in their preschool children. The study found that fever was correctly described by most parents (64 percent), with high fever reported by 56 percent. 95% thought that fever was dangerous, and febrile convolution was the most significant complication of fever (74%), accompanied by loss of consciousness, vomiting, brain injury, and loss of hearing (AlAteeq et al., 2018).

A new study to assess the awareness, behaviors, and practice of parents towards childhood fever was conducted in 2020. The study found that most parents were uncertain about the use of antibiotics for both viral and bacterial infections, and most accepted that paracetamol is required for any child with a fever. The study called for increasing the awareness and information of parents linked to drug abuse for childhood fever (Alreshidi et al., 2020). Another recent study carried out also in 2020 found that 42 percent of participants described fever at a temperature of 38.0°C, and 80 percent believed that seizure is the consequence of high fever untreated. In this study, 90% of parents demonstrated an excessive fear of fever causing body harm (Hussain et al., 2020).

In Al Baha area, no study was carried out to evaluate the perception of parents regarding the fever of their children. The goal of this research was to evaluate the attitude of parents in the management of childhood fever in Al Baha City, Saudi Arabia, and what difficulty they experience when giving medication.

## 2. SUBJECTS AND METHODS

### **Study design and time frame**

A cross-sectional study was done on residents of A-Baha city Saudi Arabia from May to November 2020.

### **Study setting**

An online survey was done.

### **Study instrument**

An electronic questionnaire was used to assess the parent's attitude to manage their children's fever.

### **Sample size**

Using the Raosoft sample size calculator and using a confidence interval of 95% and a margin of error of 5%, a calculated minimum sample size was 385 participants.

### **Study population**

431 participants were the study respondents. The inclusion criteria were parents with at least one child aged five years or less, those of Saudi nationality who live in Al Baha city, and those who answered all questionnaire items. The exclusion criteria were parents with no children or not living in Al Baha city, and those who left any questionnaire items.

### **Study instrument**

An electronic questionnaire was shared on social network programs such as (WhatsApp, Twitter and Facebook). Data collection was done through a re-designed questionnaire. The study questionnaire was developed after a literature review of similar studies. To meet study-specific objectives and ensure the questionnaire validity, a pretest was done through a pilot study on a sample of 10 participants, and questionnaires of the pilot study were not included in the analysis.



### The questionnaire had four sections

The first section covered demographic information of both parents, including age, current occupation, mother and father education, number of children, and if there was any history of febrile convulsion in the family. The second section included items on parents' knowledge of fever, including the definition of normal temperature and a high temperature, fever health effects, and source of information about fever. The third section included items on parents' practice in the management of their febrile child: how they measure the temperature, what fever treatment given without prescription when they decide to visit the health providers, and what difficulty they encounter when giving medication. The fourth section was about the parents' concerns, attitudes, and beliefs of fever including concerned about the harmful effects of high temperature, belief that fever may be useful for children's health, stated that fever causes discomfort to the child and to them also, the fears generated by the fever that parents afraid of dehydration, afraid of febrile convulsions, and brain damage.

### Statistical analysis

Data was analyzed by the (SPSS) program version 25. Qualitative data were expressed as numbers and percentages, and Chi-squared test ( $\chi^2$ ) was used to assess the relationship between variables. A p-value of  $<0.05$  was considered statistically significant.

## 3. RESULTS

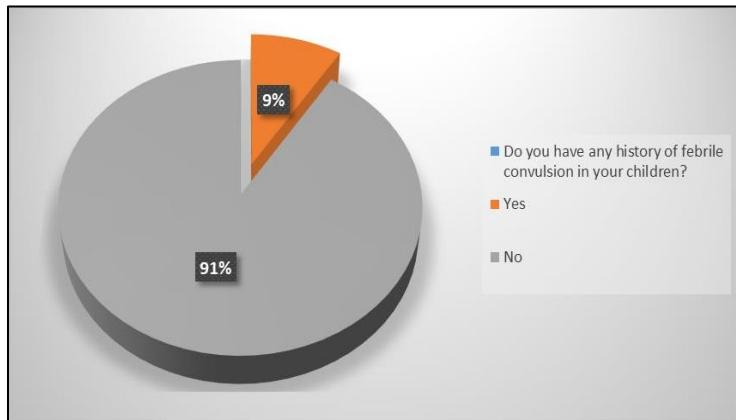
Table 1 show that 44.3% of parents had an age that ranged from 36-45 years, 82.4% were females, and 46.6% were working at offices. According to parents' education, 52% and 65.2% of fathers and mothers had a university education respectively, and about 17% (17.9%) had five children. Figure 1 illustrated that 9% of parents reported having a history of febrile convulsions in their children.

**Table 1** Distribution of the studied parents regarding their characters and number of children (No. 431)

Variable	No. (%)
Age	
18-25	43 (10)
26-35	89 (20.6)
36-45	191 (44.3)
46-55	90 (20.9)
56-65	18 (4.2)
Gender	
Male	76 (17.6)
Female	355 (82.4)
Job	
Soldier	11 (2.6)
Office	201 (46.6)
Teacher	95 (22)
Housewife	20 (4.6)
Retired	104 (24.1)
Father Education	
Primary and preparatory school	44 (10.2)
High school	129 (29.9)
University	224 (52)
Post-graduate	34 (7.9)
Mother Education	
Primary and preparatory school	65 (15.1)
High school	66 (15.3)
University graduate	281 (65.2)
Post-graduate	19 (4.4)



Number of Children	
One	65 (15.1)
Two	70 (16.2)
Three	73(16.9)
Four	80 (18.6)
Five	77 (17.9)
≥6	66 (15.3)



**Figure 1** percentage distribution of the parents according to the presence of a history of febrile convulsions in their children

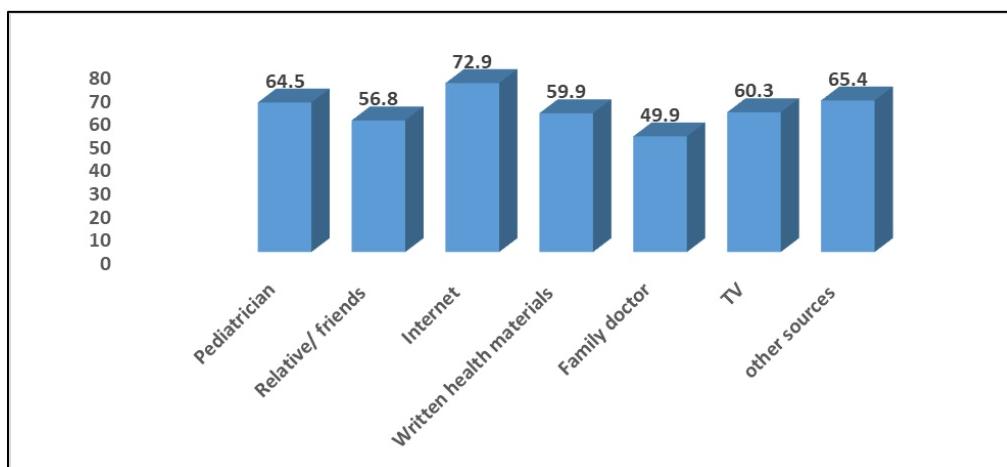
Table 2 shows that 92.8% and 93.3% of parents knew the true answer of normal temperature, and truly defined fever respectively. About 96% (96.8%) of parents thought that fever is harmful to their children, and 39.4% thought that they had enough information about fever. According to the possible harm of fever, the parents were most concerned about: 91.4%, 82.6%, 86.3%, 87.9%, 68.7%, and 74.2% thought that febrile convolution, loss of consciousness, dehydration, brain damage, hearing loss, and organ damage were the most common concerns respectively. Figure 2 shows that the most commonly mentioned sources of information about fever for parents were the internet (72.9%), pediatricians (64.5%), TV (60.3%), and written health materials (59.9%).

**Table 2** Distribution of the studied parents according to their knowledge about fever (No. 431)

Variable	No. (%)
Knowing normal temperature	
False	31 (7.2)
True	400 (92.8)
Defining fever	
False	29 (6.7)
True	402 (93.3)
Do you think that fever is harmful to your child?	
No	14 (3.2)
Yes	417 (96.8)
Do you think you have enough information about fever?	
No	12 (2.8)
Not sure	249 (57.8)
Yes	170 (39.4)
Which	
Febrile convolution	
No	37 (8.6)
Yes	394 (91.4)
Loss of consciousness	



No	75 (17.4)
Yes	356 (82.6)
Dehydration	
No	59 (13.7)
Yes	372 (86.3)
Brain damage	
No	52 (21.1)
Yes	379 (87.9)
Hearing loss	
No	135 (31.3)
Yes	296 (68.7)
Organ damage	
No	111 (25.8)
Yes	320 (74.2)



**Figure 2** Distribution of the studied participants according to their sources of information about fever (No. 431)

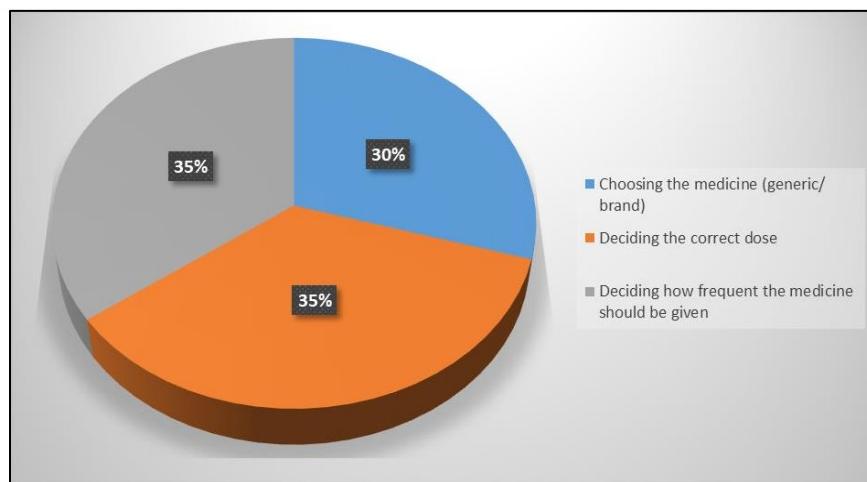
Table 3 shows that 88.4% of parents use a thermometer when they think their child has a fever, 89.6% apply cold compressions as initial management, and for 93.5% the thing that makes them decide to take the child to hospital/ health center/ ER was if he/ she has a high fever. Figure 3 shows that the most common difficulty the parents faced in giving fever medicine to their children was deciding the correct dose and deciding the frequency of dosing (35%) and choosing the medicine (30%).

**Table 3** Distribution of the studied parents according to their practice in home management of fever in their children (No. 431)

Variable	No. (%)
When you think your child has fever, you make sure by:	
Measure it manually (by hand)	299 (69.4)
Use thermometer	381 (88.4)
Take him to health center/ hospital / ER.	361 (83.8)
When your child has fever, your initial management is?	
Apply cold compressions	386 (89.6)
Give him/ her fever medicine	384 (89.1)
Give him/ her plenty of fluids	319 (74)
Consult a relative or friends	177 (41.1)
Take him/ her to the doctor right away	344 (79.8)
What make you decide to take your child to hospital/ health center/ ER if he/ she has fever?	
If he/ she has fever, regardless its level	288 (52.9)
If he/ she has high fever	403 (93.5)



If not responding to fever medicine	397 (92.1)
If not improvement within 24 hours	377 (87.5)
If there is no clear reason for fever (cold/ diarrhea/ teething. Etc.)	369 (85.6)
If he/ she has other symptoms (Runny nose / cough / diarrhea/ ear pain. Etc.)	384 (89.1)
If he/ she is younger than 3 years	346 (80.3)



**Figure 3** Percentage distribution of the studied parents according the most common difficulty they faced in giving fever medicine to their children (No. 431)

Regarding the parents' concerns, attitudes, and beliefs of fever, 92.6% were concerned about the effect of high temperature, 91.2% thought that fever causes discomfort to the child and parents, 80.3% were afraid of fever because it causes dehydration, 95.4% were afraid of febrile convulsions, 92.6% were afraid of brain damage, while 19.5% thought that fever may be useful for children's health (Table 4).

**Table 4** Distribution of the studied parents according to their concerns, attitudes, and beliefs of fever (No. 431)

Variable	No. (%)
I am concerned about the effects of high temperature	
No	32 (7.4)
Yes	399 (92.6)
fever may be useful for children's health	
No	347 (80.5)
Yes	84 (19.5)
The fever causes discomfort to the child and the parents	
No	38 (8.8)
Yes	393 (91.2)
I am afraid of fever because it causes dehydration	
No	85 (19.7)
Yes	346 (80.3)
I am afraid of febrile convulsions	
No	20 (4.6)
Yes	411 (95.4)
I am afraid of fever because it leads to brain damage	
No	32 (7.4)
Yes	399 (92.6)

Table 5 and 6 demonstrated that mothers (compared to fathers) and parents with an age ranging from 36-45 years had a significantly higher percentage of those who thought that fever may be useful for children's health ( $p=<0.05$ ). While a non-significant relationship was found between parents' gender and age, and other concerns, attitudes, and beliefs of fever ( $p=Sgt; 0.05$ ).

**Table 5** Relationship between parents' gender and their concerns, attitudes, and belief of fever (No. 431)

Variable	Gender		$\chi^2$	p-value
	Male No. (%)	Female No. (%)		
I am concerned about the effects of high temperature				
No	9 (28.1)	23 (71.9)		
Yes	67 (16.8)	332 (83.2)	2.62	0.1
fever may be useful for children's health				
No	55 (15.9)	292 (84.1)		
Yes	21 (25)	63 (75)	3.89	0.04
The fever causes discomfort to the child and the parents				
No	8 (21.1)	30 (78.9)		
Yes	68 (17.3)	325 (82.7)	0.33	0.56
I am afraid of fever because it causes dehydration				
No	15 (17.6)	70 (82.4)		
Yes	81 (17.6)	285 (82.4)	0.001	0.99
I am afraid of febrile convulsions				
No	6 (30)	14 (70)		
Yes	70 (17)	341 (830)	2.2	0.13
I am afraid of fever because it leads to brain damage				
No	11 (34.4)	21 (65.6)		
Yes	65 (16.3)	334 (83.7)	6.67	0.01

**Table 6** Relationship between parents' age and their concerns, attitudes, and beliefs of fever (No. 431)

Variable	Age					$\chi^2$	p-value
	A	B	C	D	F		
I am concerned about the effects of high temperature							
No	5 (15.6)	4 (12.5)	15 (46.9)	6 (18.8)	2 (6.3)		
Yes	38 (9.5)	85 (21.3)	176 (44.1)	84 (21.1)	16 (4)	2.69	0.06
fever may be useful for children's health							
No	29 (8.4)	72 (20.7)	163 (47)	71 (20.5)	12 (3.5)		
Yes	14 (16.7)	17 (20.2)	28 (33.3)	19 (22.6)	6 (7.1)	9.6	0.04
The fever causes discomfort to the child and the parents							
No	6 (15.8)	6 (15.8)	16 (42.1)	7 (18.4)	3 (7.9)		
Yes	37 (9.4)	83 (21.1)	175 (44.5)	83 (21.1)	15 (3.8)	3.43	0.48



I am afraid of fever because it causes dehydration No Yes	8 (9.4) 35 (10.1)	17 (20) 72 (20.8)	41 (48.2) 150 (43.4)	15 (17.6) 75 (21.7)	4 (4.7) 14 (4)	1.02	0.9
I am afraid of febrile convulsions No Yes	7 (35) 36 (8.8)	4 (20) 85 (20.7)	4 (20) 187 (45.5)	2 (10) 88 (21.4)	3 (15) 15 (3.6)	23.03	<0.001
I am afraid of fever because it leads to brain damage No Yes	10 (31.3) 33 (8.3)	7 (21.9) 82 (20.6)	9 (28.1) 182 (45.6)	6 (18.8) 84 (21.1)	0 (0.0) 18 (4.5)	19.26	0.001

N.B: (A=18-25 years, B=26-35 years, C=36-45 years, D=46-55 years, F=56-65 years)

Table 7 shows that those mothers with a university education had a significantly higher percentage of those who thought that fever may be useful for children's health, who was afraid of febrile convulsions, and who were afraid of brain damage compared to mothers with other levels of education ( $p=<0.05$ ). While a non-significant relationship was found between mothers' education, and other concerns, attitudes, and beliefs of fever ( $p=> 0.05$ ).

**Table 7** Relationship between mothers' education and their concerns, attitudes, and beliefs of fever (No. 431)

Variable	Mother's education				$\chi^2$	p-value
	Primary and preparatory school	High school	University graduate	Post-graduate		
I am concerned about the effects of high temperature No Yes	6 (18.8) 59 (14.8)	7 (21.9) 59 (14.8)	18 (56.3) 263 (65.9)	1 (3.1) 18 (4.5)	1.83	0.06
fever may be useful for children's health No Yes	49 (14.1) 16 (19)	46 (13.3) 20 (23.8)	237 (68.3) 44 (52.4)	15 (4.3) 4 (4.8)	8.66	0.03
The fever causes discomfort to the child and the parents No Yes	7 (18.4) 58 (14.8)	9 (23.7) 57 (14.5)	20 (52.6) 261 (66.4)	2 (5.3) 17 (4.3)	3.29	0.341
I am afraid of fever because it causes dehydration No Yes	2 (14.1) 53 (15.3)	19 (22.4) 47 (13.6)	48 (56.5) 233 (67.3)	6 (7.1) 13 (3.8)	6.41	0.09
I am afraid of febrile convulsions No Yes	4 (20) 61 (14.8)	9 (45) 57 (13.9)	6 (30) 275 (66.9)	1 (5) 18 (4.4)	16.4	0.001
I am afraid of fever because it leads to brain damage No Yes	9 (28.1) 56 (14)	8 (25) 58 (14.5)	14 (43.8) 267 (66.9)	1 (3.1) 18 (4.5)	8.58	0.03



On the other hand, fathers with a university education had a significantly higher percentage of those who were afraid of brain damage compared to fathers with other levels of education ( $p=<0.05$ ). A non-significant relationship was found between fathers' education, and other concerns, attitudes, and beliefs of fever ( $p=>0.05$ ) (Table 8).

**Table 8** Relationship between fathers' education and their concerns, attitudes, and beliefs of fever (No. 431)

Variable	Fathers' education				$\chi^2$	p-value
	Primary and preparatory school	High school	University graduate	Post-graduate		
I am concerned about the effects of high temperature						
No	4 (12.5)	8 (25)	17 (53.1)	3 (9.4)	0.56	0.9
Yes	40 (10)	121 (30.3)	207 (51.9)	31 (7.8)		
fever may be useful for children's health						
No	35 (10.1)	107 (30.8)	179 (51.6)	26 (7.5)	0.91	0.82
Yes	9 (10.7)	22 (26.2)	45 (53.6)	8 (9.5)		
The fever causes discomfort to the child and the parents						
No	5 (13.2)	9 (23.7)	21 (55.3)	3 (7.9)	0.98	0.8
Yes	39 (9.9)	120 (30.5)	203 (51.7)	31 (7.9)		
I am afraid of fever because it causes dehydration						
No	9 (10.6)	26 (30.6)	43 (50.6)	7 (8.2)	0.08	0.99
Yes	35 (10.1)	103 (29.8)	181 (52.3)	27 (7.8)		
I am afraid of febrile convulsions						
No	2 (10)	5 (25)	10 (50)	3 (15)	1.53	0.67
Yes	42 (10.2)	124 (30.2)	214 (50.1)	31 (7.5)		
I am afraid of fever because it leads to brain damage						
No	8 (25)	10 (31.3)	12 (37.5)	2 (6.3)	8.93	0.03
Yes	36 (9)	119 (29.8)	212 (53.1)	32 (8)		

#### 4. DISCUSSION

The aim of our study is to know the parents' attitude to manage their children's fever in Al Bahia City - KSA. To achieve the objectives of these study 431 candidates were the study participants. This study found that 44.3% of selected parents were in the age group 36-45 years, the majority of them were mothers (82.4%), the level of education of involved parents was high that is to say the majority were university graduates, especially the mothers (65.2%) the same like other studies (Alreshidi et al., 2020). More than 90% of parents in the study knew the true answer of what the normal body temperature is, and defined fever correctly. This disagrees with other studies with poor fever definition (Al-Eissa et al., 2000; Bong & Tan, 2018), most of the parents were concerned about severe complications of fever like febrile convulsions-brain damage and dehydration, these results were similar to previous studies (Chiappini et al., 2012; Al-Eissa et al., 2000; Hussain et al., 2020; Purssell, 2009). Regarding the source of information in our study about 73% of parents got their information about fever from the internet, while 64.5% from pediatricians, where as in other similar studies 74% of parents preferred to receive information from GP (Kelly et al., 2017).

In our study, we found that the majority of the parents (88.4%) confirmed the presence of fever in their children by using the thermometer for measuring the temperature. Regarding the initial management of the fever by the parents 89.6% used cold compressions, the majority of them started antipyretics and plenty of fluids (89.1%, 74%) respectively, before they were seeking for consultation or brought the child to the health center.



The majority of parents in our study took their febrile children to health centers or hospitals, while in other studies they used to treat their children at home (Awal, 2015). The parents in our study decided to bring their children to a nearby health center or hospital if they had a high fever (McErlean et al., 2001) or not responding to antipyretics, other indications for further consultations were: if no improvement within 24 hours or there was no clear detectable cause of the fever and if the child had other associated symptoms.

## 5. CONCLUSION

This cross-sectional research is the first study carried out in Al-Baha City-KSA on the level of awareness and practice of parents concerning their management of fever in their children. The research showed that most of the participants were well trained, so they had clear knowledge of fever regarding the correct meaning, potential complications, and initial treatment at home of febrile disease. Around 80 % of the participants were females (mothers) because they were closer to their children and cared for them. The study showed an increased number of parents bringing their children to near-by health centers or hospitals seeking medical consultations, increasing unnecessary health visits, and increasing the pressure on health facilities.

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## Author Contributions

Dr. Omer M. Aburaida and Dr. Ahmed A. Alzaidi participated in development of study conception and design, acquisition of data, critical revision.

Dr. Khaled A. Alzahrani, Dr. Tareq M. Alzahrani and Dr. Abdulelah M. Alghamdi participated in analysis and interpretation of data and drafting the manuscript and critical revision.

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## Conflict of Interest

The authors declare that there are no conflicts of interests.

## Informed consent

Written & Oral informed consent was obtained from all individual participants included in the study.

## Ethical approval

This study was approved by the ethical committee for research of the Faculty of Medicine-Al-Baha University with the ethical approval number (07/1441).

## Data and materials availability

All data associated with this study are present in the paper.

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